

REMARKS

Reconsideration of the instant application is respectfully requested. The present amendment is responsive to the Office Action of October 5, 2005, in which claims 1-14 were previously pending. Of those, claims 8-14 have been withdrawn from consideration as being drawn to a non-elected invention. Claims 1-7 thus remain pending.

With regard to the art of record, claims 1, 2, 4, 6 and 7 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,503,286 to Nye, III, et al. In addition, claim 3 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Nye, in view of U.S. Patent 5,334,804 to Love, et al. Claim 5 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Nye, in view of U.S. Patent 6,293,457 to Srivastava, et al. For the following reasons, however, it is respectfully submitted that the application is now in condition for allowance.

As an initial matter, claim 2 is amended as set forth above to overcome the §112, second paragraph rejection thereto. More specifically, "Cu/CrCu" is amended to read -- Cu over CrCu--. It is therefore respectfully request that the rejection §112, second paragraph rejection be withdrawn.

With regard to the rejections based on the art of record, claim 1 has been amended to more specifically recite that the selective electroplating is implemented in the absence of a photolithographically formed masking layer. Support for this amendment may be found at least in paragraphs [0014]-[0015] of the specification and in Figures 5-6. For example, paragraph [0014] of the specification states "[t]hen, the remaining photoresist 120 is stripped away (Figure 5), and the electroplating of a nickel layer 122 and gold layer 124 is implemented as shown in Figure 6."

The plating method taught by Nye, et al. applies blanket metal layers, such as TiW, CrCu and Cu, on a wafer. A layer of photoresist is then patterned to define the

solder pads in a photolithographic process. (Nye, col. 7, lines 49-53) The solder metal is subsequently "selectively" electroplated through photoresist openings (or apertures) onto copper seed. (Nye, col. 7, lines 55-62) During plating, the blanket copper seed layer works as a conducting layer for electrical current. After plating and resist strip, the blanket seed metals (e.g., Cu, CrCu and TiW) are etched away to isolate the C4 pads. (Nye, col. 7, line 67- col. 8, line 3) At end of that process, the sidewall of resulting solder pad (which is made of copper) is exposed and therefore susceptible to corrosion.

In contrast, the amended claims recite an electroplating method for electroplating at least one metal layer (e.g., nickel and gold) onto the I/O pads directly without a protective photoresist layer present during the actual plating step. Thus, during this selective plating process, electrical current is conducted through the blanket TiW layer thereby causing the nickel and gold metal plating to be formed only on the I/O pads but not on the TiW layer. After plating is completed, the conducting TiW layer outside the I/O pad area is etched away to isolate all pads. A key advantage of this process is to enable the creation of an "encapsulated" structure of plated nickel and gold layers over the underlying copper seed. This structure is shown to be effective against corrosion through the sidewall of copper seed.

Accordingly, because Nye does not teach or suggest electroplating in the absence of a resist mask layer or other equivalent protective structure, claim 1 is not anticipated by Nye, and therefore each of the outstanding §102 and §103 rejections has been overcome.

For the above stated reasons, it is respectfully submitted that the present application is now in condition for allowance. No new matter has been entered and no additional fees are believed to be required. However, if any fees are due with respect to this Amendment, please charge them to Deposit Account No. 09-0458 maintained by Applicants' attorneys.

Respectfully submitted,
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